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Texas Christian University
Fort Worth, Texas 76129

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(6) Causal Factors in Leadership Behaviors: Situational Constraints Versus Reciprocal Relationships with Subordinate Performance

James, L.R., Irons, D.M., & Hater, J.J.

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(10) Lawrence R. James, John J. Hater

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Potential causes for workgroup supervisors' perceptions of their behaviors toward each of their subordinates were examined within the framework of a reciprocal causation model. It was demonstrated initially that supervisors perceived themselves as employing different behaviors toward different subordinates, where the behaviors reflected subordinates' opportunities for influence and decision-making latitude. The reciprocal causation analysis suggested that (a) ~~supervisor behaviors and subord~~inate

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performance were reciprocally related, and (b) subordinate performance had a stronger causal effect on supervisor behaviors than workgroup context factors (e.g., size) and task attributes associated with subordinate jobs. Results were interpreted in terms of prior leadership research and person perception theory.

Causal Factors in Leader Behaviors: Situational Constraints Versus Reciprocal Relationships with Subordinate Performance

In contrast to prior attempts to identify one leadership style for a particular leader, recent research has shown that leaders tend to be flexible and to employ different behaviors for different subordinates (Aldag & Brief, 1977; Cashman, Dansereau, Graen, & Haga, 1976; Dansereau, Graen, & Haga, 1975; Evans, 1973; Graen, 1976; Graen, & Ginsburgh, 1977; Graen & Schiemann, 1978). Major reasons for such variations in leader behaviors appear to be differences in the performance levels and individual characteristics/work styles of subordinates (Barrow, 1976; Crowe, Bochner, & Clark, 1972; Evans, 1973; Haythorne, Couch,Haefner, Langham, & Carter, 1956; Lowin & Craig, 1968). For example, leaders tend to provide more opportunities for high performing than low performing subordinates to participate in decision-making, which suggests that subordinate performance is a cause of leader behaviors. However, the causal direction is not asymmetric inasmuch as leader behaviors have often been viewed as causes for subordinate performance (Stogdill, 1974). Thus, a reciprocal causation model for leader behaviors and subordinate performance is indicated (Green, 1975; Herold, 1977; Kerr & Schriesheim, 1974).

Relationships exemplifying reciprocal causation between leader behaviors and subordinate performance have been described in terms of mutual dependencies and exchanges of influence (cf. Hollander & Julian, 1969). However, mutual dependencies and influence exchanges may not include the only, or perhaps even the major, causes for leader behaviors. It has also been shown that behaviors of a leader are constrained by the type of work environment in

which he/she supervises and by the position that he/she occupies (Goodstadt & Kipnis, 1970; Heller & Yukl, 1969; Hill, 1973; Hill & Hughes, 1974; Pfeffer & Salancik, 1975; Vroom & Jago, 1978). For example, a leader with subordinates who perform complex, unprogrammed tasks may have to rely more heavily on subordinates for information to make job-related decisions than a leader with subordinates who perform routine, programmed tasks. Thus, the task complexity of subordinates' jobs has been viewed as a cause of leader behaviors. Moreover, leaders' individual characteristics may also be causes (i.e., serve as behavioral predispositions) of leader behaviors (Hinton & Barrow, 1976; Stogdill, 1974).

The interesting situation now exists where (a) one series of studies suggests mutual dependencies between leaders and subordinates in which leaders are flexible and use different behaviors for different subordinates, while (b) another series of studies suggest that the behaviors of a leader are constrained by factors such as task complexity, structure of the work environment, and behavioral predispositions of the leader. These suggestions are not necessarily incompatible; it is possible that work environments/behavior predispositions function to define a range of possible behaviors that a leader might then use in a flexible manner. On the other hand, it is also possible that a particular set of factors, such as subordinate performance levels, are the primary causes for leader behaviors. Possibilities such as these indicate the need to conduct empirical studies that compare the effects of different, potential causes for leader behaviors.

The objective of the present study was to ascertain the degree to which various factors could be viewed as tenable causes for leader behaviors, within the context of a presumed reciprocal causation between leader behaviors and subordinate performance. The leader behaviors of most interest were the

The arrows in Figure 1, both from the Xs to the Ys and among the Ys, represent the causal inferences. Associated with each arrow is a structural parameter (a C_{ik} for X⟶Y causal inferences and a B_{ij} for the reciprocal causal inferences). The structural parameters assume values that reflect the strength of causation, and procedures used to estimate these values are discussed later. Finally, the exogenous variables may be related; however, their relationships are not to be explained by the present model.

As shown in Figure 1, it was hypothesized that a supervisor would be more likely to provide a subordinate with autonomy, high performance goals, and opportunities to influence decisions when the following conditions existed.

(1) The subordinate was viewed as a high performer by the supervisor. It is important to note that supervisors' perceptions were used to measure subordinate performance (Y_2) because "supervisors will behave differently toward subordinates that they (the supervisors) see as performing differently" (Evans, 1973, p. 394). In other words, supervisors make decisions about behaviors toward a particular subordinate as a function of how they perceive that subordinate.

(2) The workgroup context could be characterized as having comparatively highly trained subordinates (X_1), lower environmental stability (X_2), lower spans of control (X_3), and lower centralization of decision-making (X_4), while the supervisor could be characterized as being well-informed by his/her superior (X_5) (Bass, Valenzi, Farrow, & Solomon, 1975; Goodstadt & Kipnis, 1970; Heller & Yukl, 1969; Hill & Hughes, 1974; James & Jones, 1976; Pfeffer & Salancik, 1975; Vroom & Jago, 1978; Vroom & Yetton, 1973).

(3) The tasks performed by subordinates tended to be challenging (X_6), pressure-producing (X_7), and involving boundary-spanning (X_8) (Barrow, 1976; Hill, 1973; Hill & Hughes, 1974; James & Jones, 1976; Pfeffer & Salancik, 1975).

(4) The supervisor was less likely to identify strongly with traditional work values such as rigid adherence to organizational policies and procedures (compliance -- X_9), experienced less anxiety (X_{10}), and had less tenure in the supervisory position (X_{11}) (Goodstadt & Kipnis, 1970; Heller & Yukl, 1969; Stotland & Canon, 1972).

(5) Subordinates had comparatively lower needs for certainty and authority (low rigidity -- X_{12}), and higher levels of achievement motivation (X_{13}) and education (X_{14}) (Aldag & Brief, 1977; Crowe et al., 1972; Haythorne et al., 1956; House & Mitchell, 1974; James et al., Note 1).

Subordinate performance (Y_2) was considered to be functionally related to the supervisor's behaviors toward the subordinate (Y_1), and the work styles and capabilities of the subordinate, as characterized by the cooperativeness of the subordinate (X_{15}), the extent to which the subordinate had a low absence rate (X_{16}), and the degree to which the subordinate was achievement motivated (X_{13}) and educated (X_{14}). It is important to note that like subordinate performance, cooperativeness and absences were based on supervisors' perceptions, and both of these variables were assumed to be causes of supervisor behaviors (Y_1). However, the causal effects of cooperativeness and absences on Y_1 were assumed to be indirect; that is, cooperativeness and absences were viewed as direct causes for perceptions of subordinate performance (Y_2) which in turn was a direct cause for Y_1. Finally, it was hypothesized that less anxious supervisors (X_{10}) who had more well-trained subordinates (X_1) would, on the average, be more prone to rate subordinates highly on the performance evaluation scales.

The causal model presented in Figure 1 is considered to be a meaningful point to begin because (a) it is based on prior research and theory and (b) it provides the opportunity to contrast a number of potential causes for supervisor behaviors within the framework of reciprocal causation between supervisor

behaviors and subordinate performance. It is nevertheless true that this causal model is only one of many models that might be postulated. As will be demonstrated, however, it was possible to test the "goodness of fit" of this model with the data. It is also noteworthy that field data were employed in this study, primarily for the reasons that supervisor behaviors were considered to be complex and multiple determined, and results were desired that had external validity for real world occurrences. This contrasts with laboratory investigations typically employed to examine the causal effects of only one or two variables on leader behaviors, using samples (e.g., college students) and treatments (e.g., games) with unknown generalizability to real world conditions. It also contrasts with strictly correlational studies in which no attempt is made to identify the underlying structure or system that generated the obtained correlations.

It is equally important to note that the end-product of the analyses will not be a unique, unassailably correct causal model. Assumptions will necessarily be made that cannot be tested and it is quite possible that more than one model will fit the data equally well (cf. James & Singh, 1978). Nevertheless, it was possible to test the logical consistency of some alternative causal hypotheses with the data and to reject untenable hypotheses. Consequently, a stronger basis for causal inference was attained. Finally, the conduct of analyses on field data within the framework of causal systems has the added advantages of (a) providing potentially fruitful explanations rather than just predictions, (b) making explicit statements of rationale and assumptions, and (c) the use of analytic procedures that force the discussion of results to be internally consistent with both assumptions and analyses (Duncan, 1966, 1975; Strotz & Wold, 1971).

METHOD

Sample

The sampling was designed to obtain work environments that differed significantly with respect to workgroup contexts (e.g., spans of control), task attributes of subordinates (e.g., job challenge), and individual differences among subordinates (e.g., education). Three samples were employed, namely (a) systems analysts and computer programmers -- the Information Systems sample, (b) firefighters -- the Firefighter sample, and (c) production line personnel -- the Production sample. Descriptions of the samples are presented below, and tests of differences among the samples on the variables studied are presented in Table 1. The sample sizes in Table 1 and reports of the structural equation analyses were based on subjects who had complete data on all variables supplied by both supervisors and subordinates (n = 554). Consequently, in the discussion of return rates below, the sample sizes will often be somewhat larger than those reported in Table 1. No significant differences existed between subjects who were included in the analyses versus those who were not included.

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Insert Table 1 about here

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Information Systems. The Information Systems sample included 126 subordinates and 21 first-line supervisors from a systems design, computer software department of a large, Western, private health care program. The 126 subordinates were employed in high level technical jobs, included systems design, computer programming, computer programs documentation, and computer

graphics. The mean age for subordinates was 26.5 years (SD = 7.2), mean job tenure was approximately 1.5 years, and the female to male ratio was approximately 1/3. The 126 subordinates reported to the 21 supervisors within the context of 21 workgroups. The 21 supervisors had a mean age of 28.6 years (SD = 5.79), a mean education of approximately three years of college, a mean job tenure of approximately 1.5 years, and a female to male ratio of 1/10. Return rates were 88% and 100% for subordinates and supervisors, respectively. For this and the remaining samples, participation was voluntary and confidentiality of answers was assured. Questionnaires were collected by the authors with assistance from organizational personnel.

Firefighters. The Firefighter sample consisted of 288 subordinates and 106 first-line supervisors from a metropolitan fire department in the Southwest. The 288 subordinates were front-line firefighters, including engineers and drivers. The mean age for subordinates was 38.54 years (SD = 9.07), mean job tenure was approximately 7 years, and only males were employed. The subordinates reported to the supervisors within the context of small workgroups (i.e., each workgroup, or company, generally consisted of a supervisor, one driver, and two engineers). One or more companies were assigned to one station. The data for supervisors showed a mean age of 46.26 years (SD = 7.57), a mean education of approximately one year of college, and a mean job tenure of approximately six years (as a supervisor). Return rates were 85% and 95% for subordinates and supervisors, respectively.

Production. The production sample was comprised by 205 subordinates and 23 first-line supervisors from four, small, paper-product manufacturing plants located in different sections of the United States. All plants performed essentially the same functions and were subsidiaries of the same parent company. The subordinate sample included only individuals who

performed direct, production-line functions (e.g., machine operators, packers, lift-truck operators). The mean age was 34.14 years (SD = 11.05), mean job tenure was approximately 3.5 years, and the female to male ratio was 1/5. The 205 subordinates reported to the 23 supervisors within the context of 23 workgroups. The 23 supervisors had a mean age of 41.0 years (SD = 8.28), the mean education was approximately one year short of high school graduation, mean job tenure was approximately 5.5 years, and the female to male ratio was 1/10. Return rates were 80% and 100% for subordinates and supervisors, respectively.

As shown in Table 1, the samples differed significantly on a number of the variables. For example, the Information Systems sample could be characterized as having low environmental stability and low spans of control, high job challenge and boundary-spanning with respect to subordinate jobs, comparatively higher anxiety among supervisors, and comparatively more educated subordinates. In contrast, the Production sample had more stable environments, higher spans of control, less challenging subordinate jobs that involved lower boundary-spanning, less anxious supervisors, and less educated subordinates. The Firefighter sample had some characteristics that resembled each of the above samples (e.g., high job challenge but comparatively low supervisor anxiety). In general, the results indicated that different work environments, and individuals in those environments, had been sampled. On the other hand, significant differences were not obtained on several variables, and the magnitudes of the omega-squares indicated that considerable within-group variation remained on all variables, including both supervisor behaviors and subordinate performance. Consequently, it did not appear that differences in either supervisor behaviors or subordinate performance could be entirely attributed to differences in the samples.

Instruments

Endogenous Variables

As noted earlier, the supervisor behaviors (Y_1) variable included three items designed to measure participation (influence) opportunities and decision-making latitude. The items were "I like to have this person's opinion in work related matters," "I encourage this person to think and act on his/her own," and "My confidence in this person is so great that I have set high goals for him/her." Each supervisor described his/her behaviors toward *each* subordinate on these items using a five-point, Likert-type scale (1 = Not at all ... 5 = To a very great extent). Interitem correlations on the total analysis sample (n = 554) ranged from .47 to .52, which suggested that the items could be combined to form one composite.

The subordinate performance (Y_2) variable was based on a composite of ratings by the workgroup supervisor for efficiency and quality of work. A modified version of the mixed standard scale procedure presented by Blanz & Ghiselli (1972) was employed to obtain the measures. For both efficiency and quality of work, supervisors rated each subordinate on two randomly presented items (each with three point scales), representing high and low performance. The correlations between the items comprising each rating scale were moderate, while the correlation between the two scales, each based on a composite of two items, was .64.

Exogenous Variables

Exogenous variables are described within the framework of the categories presented in Figure 1 and Table 1. Unless specified otherwise, all

items employed as variables or as components of a composite variable were measured on five-point, Likert scales (1 = Strongly disagree ... 5 = Strongly agree) or Likert-type scales using either an "extent" continuum or a "frequency" continuum (1 = Practically never ... 5 = Almost always).

Workgroup context. With the exception of span of control, all measures in this category were provided by the workgroup supervisor. Subordinate training (X_1) was based on the item "In my workgroup, the employees receive adequate training for their jobs." Environmental stability (X_2) was based on a four-item composite wherein the immediate organizational environment of the workgroup was described in terms of its stability, certainty, complexity, and degree of change. Items were obtained from Porter, Lawler, and Hackman (1975) and were presented in a five-point, semantic differential format (e.g., unstable 1 2 3 4 5 stable). The mean correlation among the four items was .32 (based on all 140 supervisors from the three samples).[1] Span of control (X_3) was based on the number of subordinates reporting to a supervisor, and was obtained from organizational records. Centralization of work-decisions (X_4) was based on a composite of two items (the degree to which the supervisor could allocate work among subordinates and determine the work schedule for the workgroup). A three point scale was employed (1 = Decision is made entirely by me ... 3 = Decision is made by higher levels of management), and the correlation among the two items was .34 ($p < .05$). Information from superior was measured by one item -- "My supervisor keeps me well-informed about matters affecting my workgroup" (O'Reilly & Roberts, 1977).

Task attributes-subordinate jobs. The three job descriptions were predicated on supervisors' descriptions of each unique job-type in the workgroup. Items were developed based on research by Jenkins, Nadler, and

Lawler (1975) and Jones and James (in press). Job challenge (X_6) was based on a composite of three items (e.g., This job requires the use of sophisticated and complex skills), whose average intercorrelation was .52 ($p < .01$, $n = 86$ jobs). Job pressure (X_7) was a composite of two items (e.g., This job frequently requires excessive amounts of work) whose correlation was .29. Boundary-spanning (X_8) was measured by one item -- This job requires the individual to work extensively with individuals from other parts of the organization.

Supervisor characteristics and position. All variables in this category were supplied by the supervisors. Compliance (X_9) was measured by responses to five value items (Crutchfield, 1955; Scott, 1965), which asked supervisors whether they approved of certain ways of acting on the job. The items included: acting respectfully toward supervisors, following policies and procedures, obeying supervisors' instructions, being proper and well-mannered, and finishing jobs on time. The average intercorrelation of the items was .21. Anxiety (X_{10}) was based on the item "Usually, I feel at ease while working on my present job" (Spielberger, Gorsuch, & Luschene, 1968) [the scale was reflected (i.e., 5 = Strongly disagree)]. Tenure as a supervisor (X_{11}) was based on responses to an eight-point item, where 4 = 1 to 2 years and 6 = 5 to 6 years (see Table 1).

Subordinate characteristics and work style. Subordinate cooperation (X_{15}) and absences from work (X_{16}) were based on single item ratings (three point scales) by the supervisor, and were obtained in the same section of the supervisor survey as the performance ratings. The remaining three variables were provided by subordinates in the subordinate survey. Rigidity (X_{12}) was based on 12 items; the common denominator was need for certainty (Brim, 1955; Jones, & LaRocco, Note 2), although related items from intolerance for

ambiguity, dogmatism, and authoritarianism were included (Budner, 1962; Knapp, 1976; Struening & Richardson, 1965; Trodahl & Powell, 1965). Coefficient alpha was .71 for the subordinate sample. Achievement motivation (X_{13}) was based on 13 items (coefficient alpha = .72) designed to measure an orientation toward success. Items included measures of need for achievement, preference for achievement related acitivites, aspiration level, and persistence (Fries & Knox, 1972; Hermans, 1970; Mehrabian, 1968; Steers & Braunstein, 1976). Education (X_{14}) was measured by number of years in school, where 12 represented completion of high school.

RESULTS

Flexibility in Supervisor Behaviors

A critical assumption in Figure 1 was that supervisors would employ different behaviors for different subordinates. If a supervisor did indeed employ different behaviors for different subordinates, then it follows directly that variation, implying flexibility, should be found among the (self-reported) behaviors of that particular supervisor. Flexibility in supervisor behaviors was assessed for each supervisor by computing a standard deviation on the supervisor behavior variable (Y_1), using subordinates of the same supervisor as the sample in each case. A standard deviation of zero reflects no flexibility, while standard deviations greater than zero reflect flexibility, at least as seen by the supervisor.[2] As shown in Table 2, the standard deviations on Y_1 were greater than zero for the majority of supervisors, regardless of original sample. These results indicated that most supervisors did in fact tend to vary behaviors among different subordinates in the same workgroup. The question of why supervisors varied their behaviors is addressed next.

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Insert Table 2 about here

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Causal Analysis

As described earlier, Figure 1 is a nonrecursive model that involves a presumed reciprocal causation between supervisor behaviors and subordinate performance. The statistical procedure employed to provide consistent, and generally asymptotically unbiased, estimates of the structural parameters (the B_{ij}s and C_{ik}s) was two-stage least squares (2SLS). An exposition of the 2SLS procedure was presented recently by James and Singh (1978); more extended treatments of this subject are available in statistical texts (cf. Duncan, 1975; Heise, 1975; Namboodiri, Carter, & Blalock, 1975; Johnston, 1972). The pragmatic assumptions required to employ the 2SLS procedure on the present data were (a) the causal effects were linear and additive; (b) the variables had been measured on approximately interval scales; (c) the exogenous variables were uncorrelated, in the population, with unmeasured variables that provided "unique" causation of either Y_1 or Y_2; (d) the independent variables (all variables in this case) were reliable; (e) the endogenous variables were not causes of the exogenous variables; (f) the causal system was in an "equilibrium-type condition," which suggests that the causal effects had occurred relatively rapidly and that the causal system had achieved a state of temporary stability at the time of measurement (Miller, 1971); and (g) the population disturbance terms were normally distributed with an expected value of zero. Unless the foregoing assumptions are satisfied, inconsistent estimates of the structural parameters can be expected.

It is always the case that several of the assumptions enumerated above are not empirically assessable in a particular study, if for no other reasons than that populations are not typically available and all possible unique causes for an endogenous variable are not known. Consequently, it is necessary to rely on subjective assessments to decide whether the assumptions have been reasonably met. In the present study, linearity, approximations to interval scales, reliable variables (see previous section and note also that coefficient alpha is a conservative estimate of reliability [Lord & Norvick, 1968]), an equilibrium-type condition, and specifications on the disturbance terms were, based on empirical checks where possible (e.g., linearity), assumed to have been reasonably satisfied. Furthermore, a critical factor in the selection of the exogenous variables was the assumption that $\underline{Y_1}$ and $\underline{Y_2}$ would not affect these variables significantly over relatively short periods of time (i.e., in the equilibrium-type state). No such assumption was made, or required, for comparatively longer periods of time (Miller, 1971). Finally, no assumption was made, nor could be made, that all unique causes of the endogenous variables were included in the model (cf. James & Singh, 1978). On the other hand, because of the large number of relatively heterogeneous exogenous variables included in the model, it was assumed that the causal variables omitted from the model would be approximately linearly dependent on (combinations of) the included exogenous variables. Otherwise, it was assumed that the unmeasured causal variables would be uncorrelated with the exogenous variables in the population. These (untestable) assumptions satisfied "c" above.

Given the assumptions, the 2SLS analysis proceeded as follows. First, structural equations were designed for the endogenous (dependent) variables, $\underline{Y}_1$ and $\underline{Y}_2$. In deviation form, these equations were:

$$\underline{y}_1 = \underline{B}_{12}\,\underline{y}_2 + \underline{C}_{11}\,\underline{x}_1 + \underline{C}_{12}\,\underline{x}_2 + \ldots + \underline{C}_{114}\,\underline{x}_{14} + \underline{d}_1, \quad (1)$$

$$\underline{y}_2 = \underline{B}_{21}\,\underline{y}_1 + \underline{C}_{21}\,\underline{x}_1 + \underline{C}_{210}\,\underline{x}_{10} + \underline{C}_{213}\,\underline{X}_{13} + \ldots + \underline{C}_{216}\,\underline{X}_{16} + \underline{d}_2, \quad (2)$$

where the coefficients in the equations are the structural parameters (see Figure 1). Each equation includes only variables that have a direct relationship with the endogenous variable.

The next step was to assess whether each equation was "identified." Identification refers to the question of whether sufficient information is available to obtain unique mathematical estimates of the structural parameters (Fisher, 1966; Theil, 1971). If sufficient information is available, an equation is exactly identified; if more than sufficient information is available, an equation is overidentified. In general, identification (exact identification or overidentification) is achieved when at least $\underline{J} - 1$ variables (where $\underline{J}$ is the number of endogenous variables) have been deleted from an equation, where the total number of variables that could be placed in an equation is $\underline{J} + \underline{K}$ ($\underline{K}$ = total number of exogenous variables). In this study, $\underline{J} + \underline{K} = 18$, and thus no more than 17 variables can appear in an equation [i.e., $(\underline{J} + \underline{K}) - (\underline{J} - 1) = 18 - 1 = 17$]. Since Equation 1 has 16 variables, including the dependent variable, and Equation 2 has 8 variables, both are overidentified and analyses could proceed.

It was not possible to estimate $\underline{B}_{12}$ (Equation 1) or $\underline{B}_{21}$ (Equation 2) directly because it is always assumed that reciprocally related variables ($\underline{y}_1$ and $\underline{y}_2$) will in fact be correlated with unmeasured causal variables

(which are included in the population disturbance terms -- cf. James & Singh, 1978; Miller, 1971). Consequently, attempts to estimate the B_{ij}s by direct solutions (e.g., use of OLS) result in inconsistent and biased estimates of the B_{ij}s. To obtain at least consistent estimates of the B_{ij}s, it is necessary first to neutralize the effects of omitted causal variables. This is accomplished by making y_1 and y_2 functions of the measured exogenous variables. That is, two new scores, $\hat{y}_1$ and $\hat{y}_2$, are developed by regressing both y_1 and y_2 on all of the exogenous variables. In particular,

$$\hat{y}_1 = \pi_{11} x_1 + \pi_{12} x_2 + \ldots + \pi_{116} x_{16}, \tag{3}$$

$$\hat{y}_2 = \pi_{21} x_1 + \pi_{22} x_2 + \ldots + \pi_{216} x_{16}, \tag{4}$$

where π_{ik} are unstandardized regression weights. Given the prior assumptions regarding the exogenous variables, Equations 3 and 4 provide a basis for identifying variance in y_1 and y_2 that is unrelated to the unmeasured causes of y_1 and y_2. Thus, if the x_{ik} are unrelated to unique causes of y_1 and y_2, then so must be $\hat{y}_1$ and $\hat{y}_2$ because the $\hat{y}_{ij}$ are direct linear functions of the x_{ik}.

Equations 3 and 4 are OLS equations and provide the first-stage (or reduced form) of 2SLS. In the present study, the multiple correlations were .58 ($p < .001$) for the $\hat{y}_1$ regression equation and .61 ($p < .001$) for the $\hat{y}_2$ regression equation. The magnitudes of the correlations indicated that meaningful proportions of the variance in y_1 and y_2 had been accounted for in the first-stage analysis.[3]

The second-stage of 2SLS was based on multiple regressions of each endogenous variable on the endogenous/exogenous variables with which it had

a direct relationship (i.e., see Equations 1 and 2). However, the reciprocally related endogenous variables on the right-side of the equations were replaced with their predicted scores from the first-stage regressions. The second-stage of 2SLS in the study had the following form:

$$\underline{y}_1 = \underline{\tilde{b}}_{12}\,\underline{\hat{y}}_2 + \underline{c}_{11}\,\underline{x}_1 + \ldots + \underline{c}_{114}\,\underline{x}_{14} + \underline{d}_1, \tag{5}$$

$$\underline{y}_2 = \underline{\tilde{b}}_{21}\,\underline{\hat{y}}_1 + \underline{c}_{21}\,\underline{x}_1 + \underline{c}_{210}\,\underline{x}_{10} + \underline{c}_{213}\,\underline{x}_{13} + \ldots + \underline{c}_{16}\,\underline{x}_{216} + \underline{d}_2, \tag{6}$$

where the lower case letters, $\underline{\tilde{b}}_{ij}$ and $\underline{c}_{ik}$, are unstandardized regression weights as well as sample estimates of the structural parameters, $\underline{B}_{ij}$ and $\underline{C}_{ik}$, and the $\underline{d}_j$ are residuals.[4]

Zero-order correlations between the endogenous variables and both the predicted endogenous variables and the exogenous variables are presented in Table 3. Not shown is the zero-order correlation between $\underline{y}_1$ and $\underline{y}_2$, which was .50 ($\underline{p} < .01$).[5] The estimates of the structural parameters obtained in the second-stage of the 2SLS analysis are also presented in Table 3 under the columns labeled 2SLSI. The second-stage multiple correlations were .57 ($\underline{p} < .01$) for $\underline{y}_1$ and .59 ($\underline{p} < .01$) for $\underline{y}_2$. In addition, the correlation between the estimated disturbance terms, $\underline{d}_1$ and $\underline{d}_2$, was only .34. This relatively low correlation in conjunction with the multiple correlations, which in 2SLS are primarily heuristic, suggested that the variables included in the causal model were of major significance in generating the obtained relationships between the endogenous variables and among the endogenous and exogenous variables (Duncan, Haller, & Portes, 1968).

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Insert Table 3 about here

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As shown in Table 3, the hypothesis that supervisor behaviors and subordinate performance were reciprocal causes of one another was supported, $\tilde{b}_{12}$ = .890 and $\tilde{b}_{21}$ = .132, both significant at $p < .01$. Of further interest was the finding that subordinate performance appeared to be by far the most important causal factor for supervisors' perceptions of their leader behaviors. That is, $\tilde{b}_{12}$ was substantially larger than anyone of the other parameter estimates for y_1. However, a number of these remaining parameter estimates were significant, and indicated that increases in supervisors' self-reported propensities to provide influence opportunities and decision-making latitudes to subordinates were causally related to (a) decreases in centralization of work decisions, (b) decreases in anxiety on the part of the supervisors, (c) increases in boundary-spanning and job challenge for subordinates' jobs, (d) increases in information from the supervisors' superiors, and (e) decreases in environmental stability. All of the results above corresponded to predictions (see Figure 1). Conversely, a number of the parameter estimates for y_1 were nonsignificant, the most surprising of which was span of control. Moreover, not one of the parameter estimates for subordinate characteristics (x_{12}, x_{13}, x_{14}) achieved significance.

With regard to subordinate performance, the primary causes for this endogenous variable, as perceived by the supervisor, appeared to be cooperation and absences on the part of subordinates. As noted above, supervisor behaviors also appeared to be a significant cause, but the estimated weight for y_1 was lower than those for x_{15} and x_{16}. The direction of causal inference for the variables above was consistent with Figure 1; however, the small but significant weight for anxiety was opposite to the predicted direction (i.e., it was predicted that high supervisor anxiety would result

in lower ratings for subordinates). Comparison of the nonsignficant zero-order correlation between anxiety and $\underline{y_2}$ (-.05) and the unstandardized regression weight (.044) indicated that anxiety functioned as a suppressor variable in this analysis. Suppressor variables are difficult to interpret causally, and thus the low weight for anxiety will not be addressed further. Finally, it was somewhat surprising to find that neither achievement motivation nor education had significant estimated structural parameters for $\underline{y_2}$, especially given the results presented in Table 1.

The results presented thus far suggest that the causal model presented in Figure 1, or Structural Equations 1 and 2, provided a meaningful and significant basis for attempting to make inferences with respect to the causes of $\underline{y_1}$ and $\underline{y_2}$. However, as noted earlier, it cannot be assumed that the causal model is unique or unassailably correct, the primary reasons being that a number of untestable assumptions were made in its development and in the justifications for applying 2SLS. On the other hand, it is possible to achieve a stronger basis for causal inference by testing the logical consistency of alternative causal hypotheses with the data, as described below.

The logical consistency tests were based on the "ommitted parameter" procedure recommended by Duncan (1975), James & Singh (1978), and Namboodiri et al., (1975). This procedure involves estimating the values of structural parameters that were assumed to equal zero in the original causal model. For example, in Figure 1, cooperation ($\underline{x_{15}}$) was not expected to affect $\underline{y_1}$ directly. Consequently, an arrow between $\underline{X_{15}}$ and $\underline{y_1}$ was not included in the model, which in mathematical terms means $\underline{C_{115}}$ was expected to be zero. $\underline{C_{115}}$ is referred to as an omitted parameter. A test of logical consistency could be conducted by placing an arrow between $\underline{X_{15}}$ and $\underline{y_1}$ and

assessing whether the estimate of the structural parameter associated with the arrow (i.e., c_{115}) is in fact approximately zero. The estimate is obtained by conducting a new 2SLS analysis on what is now a different causal model.

Review of Figure 1 demonstrates the existence of a number of ommitted parameters, especially for y_2 (e.g., C_{115}, C_{116}, C_{22} through C_{29}, etc.). To design logical consistency tests, one selects those omitted parameters in which one has the least faith that the parameter estimate will in fact be approximately zero. There is a limiting condition, however, which is that one cannot select more variables than are needed to identify exactly the structural equations.[6] In the present study, this meant that only one variable could be added to the y_1 structural equation (see prior discussion). The selected variable was cooperation because this variable was moderately correlated with y_1 (.33 -- see Table 3), and it was conceivable that the cooperativeness of a subordinate could affect supervisor behaviors directly as well as through subordinate performance.

As noted above, a number of variables could have been added to the y_2 structural equation, which was highly overidentified. However, review of the zero-order correlations in Table 3 suggested that only a few of these variables might achieve a significant parameter estimate. It was decided to include only one variable, job pressure (x_7), because it was conceivable that supervisors might be more lenient when rating subordinates who had comparatively high pressure jobs. Job challenge (x_6) was not included because it was considered sufficient to test only one of a set of correlated job variables [the correlation between X_6 and X_7 was .38 ($p < .01$)].

The new 2SLS analysis demonstrated that job pressure did not have a significant direct effect on y_2 [parameter estimate = .021 ($p > .05$)].

However, cooperation did have a significant direct effect on y_1 [parameter estimate = .16 ($p < .05$)]. Cooperation still maintained a direct effect on y_2, and inclusion of cooperation in the y_1 equation did not affect strongly the parameter estimate of y_2 on y_1 [i.e., controlling $\tilde{b}_{12}$ for cooperation reduced the parameter estimate for y_2 from .89 in the first 2SLS to .605 ($p < .01$) in the second 2SLS]. A final set of parameter estimates is presented in Table 3 under the column designated 2SLSII. Cooperation was included in the y_1 equation, but job pressure was not included in the y_2 equation.

In sum, the logical consistency tests generally supported the original structural model (e.g., y_1 and y_2 maintained a reciprocal causation relationship). Other logical consistency tests might have been conducted; however, as noted by James and Singh (1978), there is no reason to test all possible permutations and combinations if it is believed that only a few causal structures are meaningful. Based on prior research and review of the zero-order correlations in Table 3, it appeared that the above tests were the ones of primary interest in this study. An exception was the possibility that cooperation and supervisor behaviors might be related reciprocally. Unfortunately, this possibility could not be addressed here because sufficient variables were not available to identify a structural equation for cooperation, and a reciprocal causation model between cooperation and supervisor behaviors remains as a potentially competing causal model. On the other hand, the results supported, in a consistent and significant way, many of the original expectations, especially the reciprocal causation between y_1 and y_2, and provided an avenue for comparing the strengths of effects of various variables on supervisor behaviors. Consequently, causal inferences are discussed below.

DISCUSSION

Of initial concern was the finding that supervisors perceived themselves as employing different behaviors toward different subordinates, where the behaviors reflected opportunities for subordinate influence in decision-making, autonomy, and achievement of high goals. These results supported those obtained by Graen and associates (Cashman, et al., 1976; Dansereau et al., 1975; Graen, 1976; Graen & Ginsburgh, 1977; Graen & Schiemann, 1978), who also found that leaders were perceived by themselves and/or subordinates as providing varying participation opportunities and decision-making latitudes for different subordinates in the same workgroups. The results also supported other field as well as experimental studies, where it was shown that leaders tended to employ flexible styles (Aldag & Brief, 1977; Barrows, 1976; Crowe et al., 1972; Ferris & Lim, 1969; Herold, 1977; Hill, 1973; Hill & Hughes, 1974; Lowin & Craig, 1968). It appears reasonable to conclude that most leaders, including first-line workgroup supervisors, do in fact use varying (flexible) leadership styles. Consequently, attempts to characterize a leader in terms of one type of style would appear to be unproductive (Graen, 1976; Kerr & Schriesheim, 1974).

Given that most supervisors were flexible, this study addressed the following questions (a) Is this flexibility a function of reciprocal causation (mutual dependencies) between supervisor behaviors and subordinate efficiency and quality of work? and (b) Are constraints placed on the degree to which supervisors can be flexible, where constraints were operationalized in terms of various situational factors and individual differences (predispositions) among supervisors? These questions were examined through the use of 2SLS, which provided the opportunity to test hypotheses

of reciprocal as well as other forms of causation with field data.

In the discussion of this analysis, special emphasis will be placed on the fact that all of the significant findings were based on variables provided by supervisors, which can be viewed as supervisors' perceptions. Thus, the results of the 2SLS analysis are interpreted from the perspective of the supervisors' perceptual/cognitive systems. While this approach limits somewhat the generalizability of the findings, it is also the case that cognitive constructions and information processing play central roles in psychological theory and research (cf. Endler & Magnusson, 1976; James, Hater, Gent, & Bruni, in press; Mischel, 1973). Furthermore, as will be shown, the use of "person perception" theory provided a meaningful basis for interpreting the results.

Summary of 2SLS Results

The findings of the 2SLS analysis (2SLSII) are summarized in the following three points:

1. Supervisors' perceptions of their behaviors toward subordinates were related reciprocally to their perceptions of subordinates' performance. The reciprocal causation aspect of these findings is consistent with prior theory/research in which it was suggested that leaders and subordinates were mutually dependent and causes of one anothers' behaviors (Green, 1975; Herold, 1977; Hollander & Julian, 1969; Kerr & Schriesheim, 1974). Also supported were findings that subordinate performance is a major cause of leader behaviors (Barrow, 1976; Evans, 1973; Lowin & Craig, 1968). It is also interesting to note that when the estimated parameter values for $\underset{\sim}{b}_{12}$ (.60) and $\underset{\sim}{b}_{21}$ (.13) were transformed into ratios that reflect the amount of change in the underlying measurement scales (i.e., .60/5 = .12

and .13/3 = .04), the effect of subordinate performance on supervisor behaviors was perceived as approximately three times stronger than the effect of supervisor behavior on subordinate performance. The salience of this point is addressed later (a sampling distribution does not exist for testing the difference between $\tilde{b}_{12}$ and $\tilde{b}_{21}$).

2. From the standpoint of the supervisors, subordinate performance had a stronger causal effect on supervisor behaviors than factors reflecting workgroup context, subordinates' task attributes, supervisor characteristics and position, and subordinate characteristics/work styles (including cooperation). Nevertheless, certain variables from the domains above appeared to have causal effects on the supervisor behaviors. For example, supervisors perceived themselves as providing subordinates with more autonomy, higher goals, and more opportunities for influence when they (the supervisors) perceived that (a) work decisions were not highly centralized, connoting that supervisors had the authority to make decisions and to delegate responsibilities/authority; (b) they were kept well-informed by their superiors, suggesting that supervisors had information regarding types of decisions that would be accepted by higher levels of management; (c) subordinates had challenging jobs, indicating that supervisors had to rely on subordinates both to obtain information to make job-related decisions and to complete complex tasks that required a certain degree of autonomy (House & Mitchell, 1974; Vroom & Jago, 1978; Vroom & Yetton, 1973); (d) a subordinate was involved in boundary-spanning, where it would be expected that the subordinate would have to have a certain degree of autonomy in decision-making; and (e) the supervisors' jobs did not produce high levels of anxiety, which suggested that the supervisors were reasonably confident of their leadership abilities and consequently were not prone to maintain tight controls and an authoritarian decision structure (Goodstadt & Kipnis, 1970; Stotland & Canon, 1972).

The results and interpretations above indicated that certain individual differences and the work environment factors did in fact influence (constrain) supervisors' (perceptions of their) behaviors, thus supporting conclusions by Barrow (1976), Bass et al. (1975), Heller and Yukl (1969), Hill (1973), Hill & Hughes (1974), Pfeffer and Salancik (1975), and Vroom and Jago (1978). However, these findings must be qualified in two regards. First, even though factors such as perceived centralization and anxiety may have defined a range of acceptable behaviors, it was clearly indicated that within these ranges the supervisors perceived themselves as employing different behaviors for different subordinates. Second, the parameter estimates for a number of presumably important exogenous variables were low and nonsignificant (e.g., span of control, rigidity). Such results likely reflected several conditions, including controls for more salient causal variables (i.e., the parameter estimates are unstandardized regression weights that include controls for all other independent variables in the equations) and the possibility that these variables were not perceived as primary causal factors by the supervisors.

3. In the supervisors' perceptual/cognitive system, the primary causes for subordinates' performance levels were subordinates' work styles -- cooperation and absences -- and the supervisors' own behaviors. However, the former variables were viewed as more important than the latter (i.e., the parameter estimates for the work style variables were approximately twice as large as the parameter estimate for supervisor behaviors). It was somewhat suprising that the subordinate characteristics variables failed to relate significantly to subordinate performance. However, it should be remembered that rigidity, achievement motivation, and education were pro-

vided by subordinates, and the possibility existed that supervisors' perceptions of a subordinate's rigidity, motivation, and knowledge differed from subordinate's self-perceptions.

Integration of Results with Person Perception Theory

Interpretation of the results from the perspective of person perception theory provided an additional source for assigning psychological meaning to the findings (cf. Jones, Kanouse, Kelly, Nisbett, Valins, & Weiner, 1972; Stotland & Canon, 1972; Wegner & Vallacher, 1977). Basic postulates of this theory are (a) perceivers (observers) often tend to attribute causes of the behaviors of others (actors) to the traits/styles of the others rather than to situational factors, while (b) perceivers are more likely to attribute the causes of their own behaviors to situational factors rather than to their own traits/styles. These two postulates received strong support in the present study. For example, supervisors (perceivers) attributed causes of subordinates' (others) performance more to the subordinates' own work styles than to situational factors, including their (the supervisors') leadership behaviors. On the other hand, when the supervisors' own behaviors were at issue, the causal attributions shifted to situational factors (e.g., subordinates' performance, which is a situational variable with respect to supervisors, and centralization of structure) rather than to the supervisors' own traits/styles (compliance). Anxiety may be an exception here, although it is possible that supervisors made external (situational) rather than internal attributions with respect to this variable.

The addition of the findings from the reciprocal causation analysis provided another important interpretation that appears to be consistent with person perception theory. As discussed earlier, supervisors perceived

that the causal effects of their own behaviors on subordinates' performance were weaker than the causal effects of subordinates' performances on their (the supervisors') own behaviors. This suggests that in a reciprocal causation system, perceivers were more likely to attribute stronger causal effects to others' behaviors when the perceivers' own behaviors were involved, but, in turn, to attribute weaker causal effects to their own behaviors in relation to the behaviors of others. The implication is, therefore, that in a mutually dependent relationship, the perceiver may overemphasize the causal effects of others' behavior on his/her own behavior, while deemphasizing the causal effects of his/her own behavior on the success/failure of others. The latter point may, in part, involve perceptual/cognitive defense mechanisms (James et al., in press), and has rather interesting implications for perceptual distortions in ratings when the rater and ratee are mutually dependent. However, additional research is needed to test the generalizability of the obtained results. It is recommended that such research be conducted within the framework of reciprocal causation -- mutual dependence models that allow the researcher to determine underlying, and perhaps unrecognized (on the part of the perceiver), attributions. For example, it is somewhat questionnable that, when asked directly, supervisors would report that they perceive themselves as having rather low impact on the performance levels of their subordinates.

Conclusions

In conclusion, it must be stressed that the preceding causal inferences are only that -- inferences. The strongest statement that can be made on the basis of the 2SLS analysis is that the causal hypotheses underlying the inferences, with the possible exception of cooperation, should not be

rejected within the context of models tested (Duncan, 1975). The reasons for this circumspect wording is that (population) assumptions were made that could not be tested and it is almost always the case that alternative causal models exist which might explain the data equally well (James & Singh, 1978). In addition, the possibility exists that method variance served to inflate spuriously relationships among the variables provided by supervisors. However, not only did some of these variables have low, nonsignificant relationships, but the first-stage of 2SLS purged any direct contributions of method variance from the crucially important supervisor behavior - subordinate performance relationships. Moreover, in response to the method variance issue as well as to the former potential limitations, it is noteworthy that many of the results of the present study were consistent with results obtained in prior experimental examinations of the causes of leader behaviors (see prior discussion). Such consistency of findings provides support for the internal validity of the causal model employed in this study as well as at least partial support for the external validity of the experimental studies. On the other hand, needs for additional research have been addressed, and potentially fruitful avenues of investigation were suggested.

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Footnotes

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Requests for reprints should be sent to Lawrence R. James, Institute of Behavioral Research, Texas Christian University, Fort Worth, Texas 76129.

[1]The decision to combine items to form composites was based on the average intercorrelation of conceptually related items (using Fisher *z* transformations) when the number of items was nine or less. The required average intercorrelation was set at .20 or greater, which is consistent with the logic that the items were sampled from the same domain (Nunnally, 1967). For 10 or more items, coefficient alpha was used as an indicator of the internal consistency form of reliability. Coefficient alpha was not employed for nine or less items because this statistic is highly sensitive to the number of items and underestimates internal consistency when only a few items are used, unless, of course, the items are redundant (cf. Lord & Novick, 1968).

[2]This study addressed only supervisors' perceptions of their supervisor behaviors. However, James et al. (Note 1) demonstrated that these

same, self-reported behaviors were related significantly to subordinates' perceptions of participation opportunities and influence in the Information Systems and Production samples. These results connoted at least a partial degree of agreement between supervisors' and subordinates' perceptions of supervisors' behaviors, which means that subordinates also reported variations in supervisors' behaviors.

[3]As noted earlier, the structural equation analysis was conducted on the sample of subordinates (n = 554). Separate scores for each subordinate were already available for variables y_1, y_2, and x_{12} through x_{16}. Scores for subordinates on variables x_1 through x_{11} were obtained by assigning the appropriate workgroup, task, or supervisor score to all subordinates in a particular workgroup (same supervisor) or task (e.g., all subordinates in a particular workgroup received the same score on x_1).

[4]Readers may be more familiar with the use of standardized regression weights to estimate structural parameters, in which case the structural equations are viewed as "path equations" (e.g., path analysis). However, for reasons beyond the scope of this presentation, a salient rationale exists for using unstandardized weights (structural equation analysis) rather than standardized weights (path analysis). The reader is referred to Blalock (1967), Tukey (1964), Wiley and Wiley (1971), and Wright (1960) for discussions of this issue.

[5]Zero-order correlations among the exogenous variables are available from the authors. As a brief summary, the correlations tended to be low, with comparatively few correlations $>|\pm.20|$. The only correlation $\geq|\pm .40|$ occurred between stability of the work environment and tenure [$r(552) = .48$, $p < .01$].

[6]It is only possible to conduct logical consistency tests when the original structural equations are overidentified, which means that there will have to be some omitted parameters.

Table 1

Means, Standard Deviations, and Sample Comparisons

Variables	Maximum Possible Score	Production M	Production SD	Firefighters M	Firefighters SD	Information Systems M	Information Systems SD	Omega-Squared
Endogenous Variables								
Y_1 Supervisor Behaviors	5	3.28	.71	3.62	.75	3.70	.80	.04**
Y_2 Subordinate Performance	3	2.17	.43	2.34	.44	2.38	.50	.02**
Exogenous Variables								
Workgroup Context:								
X_1 Subordinate Training	5	3.70	.73	3.66	.67	3.29	.90	.02
X_2 Environmental Stability	5	3.25	.65	3.36	.80	2.22	.63	.21**
X_3 Span of Control	--[a]	11.55	5.26	3.00	.00	4.42	.97	.60**
X_4 Centralization of Work Decisions	3	2.70	.86	2.73	.75	2.52	.75	.03
X_5 Information from Superior	5	3.55	1.05	3.79	.84	3.53	.93	.00
Task Attributes -- Subordinate Jobs:								
X_6 Job Challenge	5	3.21	.74	4.08	.34	3.89	.88	.15**
X_7 Job Pressure	5	2.99	.72	3.72	.42	3.52	.98	.09**
X_8 Boundary-Spanning	5	2.97	1.17	3.21	.17	3.86	.89	.10**
Supervisor Characteristics and Position:								
X_9 Compliance	5	4.14	.40	3.89	.40	3.64	.50	.08**
X_{10} Anxiety	5	2.00	.97	1.78	.69	2.76	1.18	.14**
X_{11} Tenure	8	5.95	2.11	6.39	1.60	3.95	1.56	.20**
Subordinate Characteristics and Work Style:								
X_{12} Rigidity	5	4.00	.41	3.77	.42	3.54	.54	.12**
X_{13} Achievement Motivation	5	3.85	.41	3.77	.36	3.91	.47	.02**
X_{14} Education	--	11.15	1.81	12.61	1.64	14.96	1.54	.40**
X_{15} Cooperation	3	2.50	.64	2.63	.60	2.70	.56	.01*
X_{16} Absences	3	2.23	.78	2.11	.65	1.91	.60	.02**

Note. ns for data on individual subordinates (variables Y_1, Y_2, X_{12} through X_{16}) were 162 for Production, 268 for Firefighters, and 124 for Information Systems; ns for data on workgroups and supervisors (variables X_1 through X_5, and X_9 through X_{11}) were 20 for Production, 99 for Firefighters, and 21 for Information Systems; ns for task attributes (variables X_6 through X_8) were 56 for Production, 6 for Firefighters, and 24 for Information Systems.

[a] Scale free to vary.

* $p < .05$ on F-tests.

** $p < .01$ on F-tests.

Table 2

Flexibility in Supervisor Behaviors Within Each Workgroup

	Frequency of Supervisors Within Each Standard Deviation Range				
Sample	0	.01 to .25	.26 to .50	.51 to .75	>.75
Information Systems (n = 19)	1	2	4	4	8
Firefighters (n = 96)	10	25	16	29	16
Production (n = 20)	1	5	7	4	3
Total	12	32	27	37	27

Note. Only supervisors with two or more subordinates were included in this analysis.

Table 3

Zero-Order Correlations and Estimates of Structural Parameters Based on the Second-Stage 2SLS

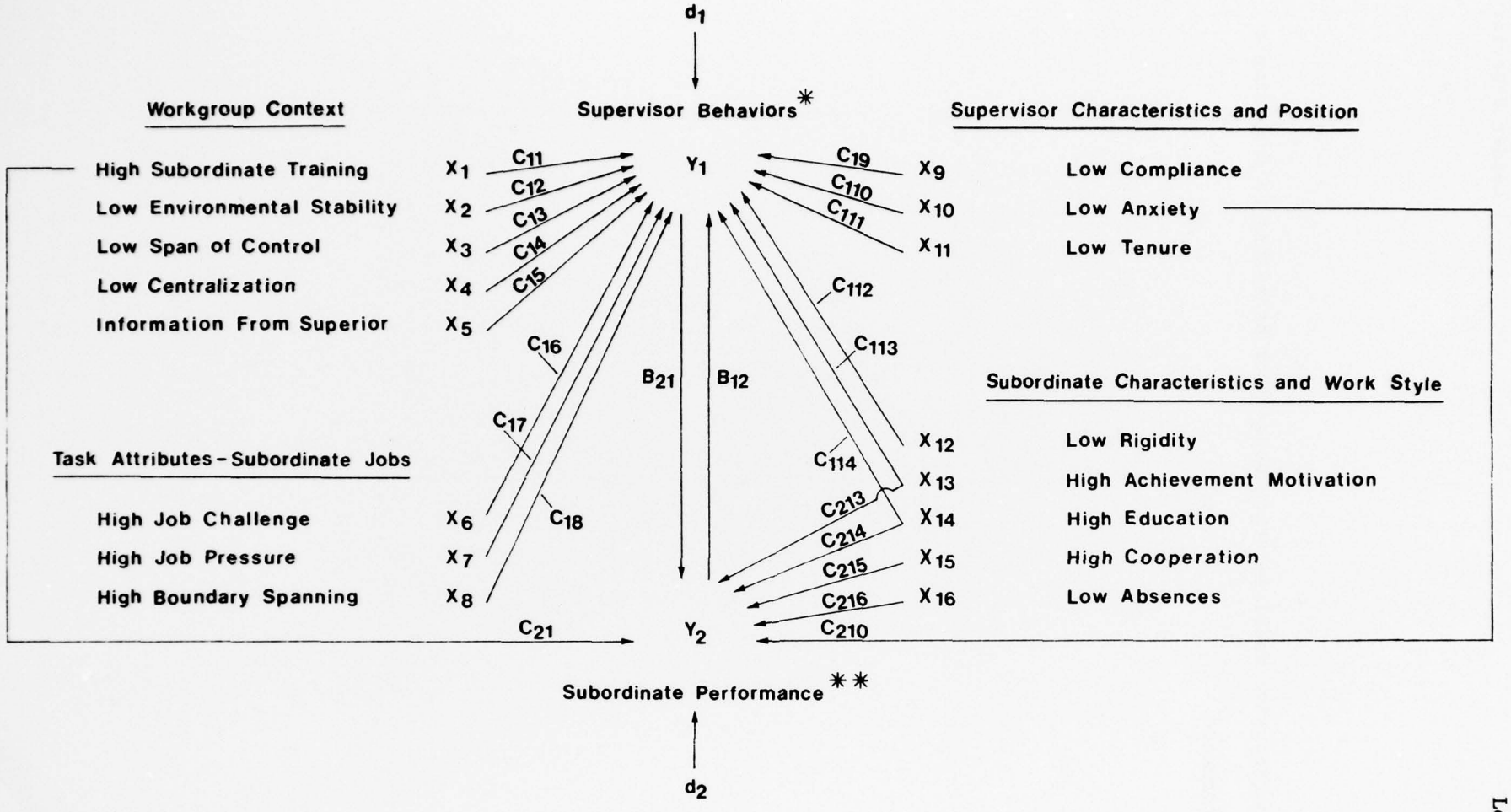
Variables	Endogenous Variables: Supervisor Behaviors (y_1) r	2SLSI	2SLSII	Subordinate Performance (y_2) r	2SLSI	2SLSII
First-Stage Estimates						
$\hat{y}_1$ Supervisor Behaviors	.58**	----- [a]	-----	.43**	.132**	.132**
$\hat{y}_2$ Subordinate Performance	.40**	.890**	.605**	.61**	-----	-----
Exogenous Variables						
Workgroup Context:						
x_1 Subordinate Training	.17**	.036	.036	.09*	.008	.008
x_2 Environmental Stability	-.16**	-.031**	-.033**	-.02	-----	-----
x_3 Span of Control	-.20**	-.006	-.008	-.08	-----	-----
x_4 Centralization of Work Decisions	-.18**	-.119**	-.121**	-.06	-----	-----
x_5 Information from Superior	.14**	.088**	.079**	-.04	-----	-----
Task Attributes:						
x_6 Job Challenge	.33**	.058**	.056**	.09*	-----	-----
x_7 Job Pressure	.29**	.022	.034	.13**	-----	-----
x_8 Boundary-Spanning	.24**	.092**	.090**	.06	-----	-----
Supervisor Characteristics and Position:						
x_9 Compliance	-.11**	-.084	-.060	-.04	-----	-----
x_{10} Anxiety	-.13**	-.112**	-.104**	-.05	.044*	.044*
x_{11} Tenure	.01	.002	.006	.03	-----	-----
Subordinate Characteristics and Work Style:						
x_{12} Rigidity	-.10*	-.003	-.004	.00	-----	-----
x_{13} Achievement Motivation	.06	.007	.008	.04	.001	.001
x_{14} Education	.10*	-.008	-.009	.05	.007	.007
x_{15} Cooperation	.33**	-----	.160**	.46**	.277**	.277**
x_{16} Absences	-.16**	-----	-----	-.38**	-.225**	-.225**

Note: Analyses were conducted on a sample of 554 subordinates.

[a] Variable was not included in the structural equation for this endogenous variable.

* $p < .05$

** $p < .01$



* High opportunities for subordinate autonomy, influence, and achievement

** High efficiency and quality of work

Figure 1. A nonrecursive model relating supervisor behaviors to subordinate performance.

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ONR Field

Director
ONR Branch Office
536 S. Clark St.
Chicago, IL 60605

Research Psychologist
ONR Branch Office
536 S. Clark St.
Chicago, IL 60605

Principal Investigators

Dr. Alvin J. Abrams
Navy Personnel R & D Center
San Diego, CA 92152

Dr. Clayton P. Alderfer
Dept. of Administrative Sciences
Yale University
New Haven, CT 06520

Dr. Earl A. Alluisi
Old Dominion University Research
Foundation
Norfolk, VA 23508

Dr. James A. Bayton
Dept. of Psychology
Howard University
Washington, D.C. 20001

Dr. Carl Bennett
Battelle Memorial Institute
4000 N.E. 41st Street
Seattle, WA 98105

Dr. H. Russell Bernard
Dept. of Sociology & Anthropology
West Virginia University
Morgantown, WV 26506

Dr. Milton R. Blood
School of Business
Georgia Institute of Technology
Atlanta, GA 30332

Dr. Davis B. Bobrow
University of Maryland
College Park, MD 20742

Dr. David G. Bowers
Institute for Social Research
University of Michigan
Ann Arbor, MI 48106

Dr. John J. Collins
Vice President
Essex Corporation
201 N. Fairfax St.
Alexandria, VA 22314

Principal Investigators (cont.)

Dr. Rudi Klaus
Syracuse University
Public Administration Dept.
Maxwell School
Syracuse, NY 13210

Mr. Thomas L. Lalley
Center for the Study of Crime & Delinquency
NIMH
5600 Fishers Lane
Rockview, MD 20852

Dr. Edward E. Lawler
Battelle Human Affairs Research Centers
4000 N.E. 41st Street
P.O. Box 5395
Seattle, WA 98105

Dr. Arie Y. Lewin
Duke University
Duke Station
Durham, NC 27706

McBer and Company
137 Newbury St.
Boston, MA 02139

Dr. Morgan W. McCall, Jr.
Center for Creative Leadership
5000 Laurinda Dr.
P.O. Box P-1
Greensboro, NC 27402

Dr. Elliot M. McGinnies
Psychology Dept.
American University
Washington, D.C. 20016

Dr. Terence R. Mitchell
School of Business Administration
University of Washington
Seattle, WA 98195

Dr. William H. Mobley
College of Business Administration
University of S. Carolina
Columbia, SC 29208

Dr. Peter R. Monge
Dept. of Speech-Communication
California State University
San Jose, CA 95192

Dr. Richard T. Mowday
College of Business Administration
University of Nebraska, Lincoln
Lincoln, NB 68588

Dr. Herbert R. Northrup
Industrial Research Unit
University of Pennsylvania
Philadelphia, PA 19174

Dr. A.F.K. Organski
3068 Institute for Social Research
University of Michigan
Ann Arbor, MI 48104

Dr. Benson E. Penick
Carnegie-Mellon University
Margaret Morrison 410
Pittsburgh, PA 15213

Johannes M. Pennings
Graduate School of Industrial Administration
Carnegie-Mellon University
Schenley Park
Pittsburgh, PA 15213

Mr. Luigi Petrullo
2431 N. Edgewood St.
Arlington, VA 22207

Dr. Karlene H. Roberts
School of Business Administration
University of California
Berkeley, CA 94720

Dr. John Ruhe
University of North Carolina
Dept. of Business Administration
Charlotte, NC 28223

Dr. Irwin Sarason
Dept. of Psychology
University of Washington
Seattle, WA 98195

Dr. Edgar H. Schein
Sloan School of Management
Massachusetts Institute of Technology
Cambridge, MA 02139

Dr. Saul B. Sells
Texas Christian University
Fort Worth, Texas 76129

Principal Investigators (cont.)

Dr. Kevin E. Coray
School of Management
Clarkson College
Potsdam, NY 13676

Dr. John A. Drexler, Jr.
Battelle Human Affairs Research Center
4000 N.E. 41st Street
Seattle, WA 98105

Dr. George T. Duncan
Carnegie-Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213

Dr. Dynes
Ohio State University Research Foundation
1314 Kinnear Road
Columbus, OH 43212

Dr. Robert Ellison
IBRIC
1570 South 1100 East
Salt Lake City, UT 84106

Dr. Fred E. Fielder
Dept. of Psychology
University of Washington
Seattle, WA 98105

Dr. Samuel L. Gaertner
Dept of Psychology
University of Delaware
220 Wolf Hall
Newark, DE 19711

Dr. Michael Gent
Dept. of Management
Canisius College
Buffalo, NY 14208

Dr. Paul S. Goodman
Graduate School of Industrial Administration
Carnegie-Mellon University
Schenley Park
Pittsburgh, PA 15213

Dr. Gloria L. Grace
System Development Corporation
2500 Colorado Avenue
Santa Monica, CA 90406

Dr. Eric Gunderson
Naval Health Research Center
San Diego, CA 92152

Dr. Richard Hackman
Dept. of Administrative Sciences
Yale University
New Haven, CT 06520

Dr. Douglas T. Hall
Earl Dean Howard Professor and Chairman
Dept. of Organizational Behavior
Graduate School of Management
Northwestern University
Evanston, IL 60201

Dr. Thomas W. Harrell
Graduate School of Business
Stanford University
Stanford, CA 94305

Dr. Charles F. Hermann
Ohio State University Research Foundation
1314 Kinnear Road
Columbus, OH 43212

Dr. Edwin Hollander
Dept. of Psychology
State University of New York at Buffalo
4230 Ridge Lea Rd.
Buffalo, NY 14226

Mr. Daniel F. Huck
General Research Corporation
Westgate Research Park
McLean, VA 22101

Dr. Charles L. Hulin
Dept. of Psychology
University of Illinois
Champaign, IL 61820

Dr. Faris Kirkland
University City Science Center
Center for Social Development
3624 Science Center
Philadelphia, PA 19104

Principal Investigators (cont.)

Dr. H. Wallace Sinaiko
Program Director
Manpower Research & Advisory Services
Smithsonian Institution
801 N. Pitt St. - Suite 120
Alexandria, VA 22314

Dr. A.L. Slafkosky
Scientific Advisor
Commandant of the Marine Corps
(Code AX)
Washington, D.C. 20380

Dr. Richard Steers
Graduate School of Management &
Business
University of Oregon
Eugene, Oregon 97403

Eugene F. Stone
Dept. of Administrative Sciences
Purdue University
West Lafayette, IN 47904

Dr. Siegfired Streufert
Dept. of Psychology
Purdue University
Lafayette, IN 47907

Dr. Richard E. Sykes
Minnesota Systems Research, Inc.
2412 University Ave., S.E.
Minneapolis, MN 55414

Dr. H.H. Vreeland III
Human Sciences Research, Inc.
Westgate Research Park
7710 Old Springhouse Road
McLean, VA 22101

Dr. Victor H. Vroom
School of Organization &
Management
Yale University
56 Hillhouse Avenue
New Haven, CT 06520

Army

Army Research Institute
Commonwealth Bldg.
1300 Wilson Blvd.
Rosslyn, VA 22209

Coast Guard

Chief, Psychological Research Branch
U.S. Coast Guard (G-P-1/62)
400 7th Street, S.W.
Washington, D.C. 20590

- -

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ACOS Research & Program Development
Chief of Naval Education & Training
Naval Air Station
Pensacola, FL 32508

Human Resource Management Center
Bldg. 304
Naval Training Center
San Diego, CA 92133

Human Resource Management Center
Norfolk
5621-23 Tidewater Dr.
Norfolk, VA 23511

Human Resource Management Center
Box 23
FPO, NY 19510

Commanding Officer
ONR Branch Office
1030 E. Green St.
Pasadena, CA 91106

Psychologist
ONR Branch Office
1030 E. Green St.
Pasadena, CA 91106

Navy Personnel R & D Center
Code 10
San Diego, CA 92152

Navy (cont.)

Chief of Naval Personnel
Assist. for Research Liaison
(Pers-Or)
Washington, D.C. 20370

Cdr. Paul D. Nelson, MSC, USN
Head, Human Performance Div.
(Code 44)
Navy Medical R & D Command
Bethesda, MD 20014

Office of Manpower Mangement
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Operations & Research
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Lab
Naval Submarine Base, New London
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Orlando, FL 32813

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Department of the Navy
Human Resource Management Center
Washington, D.C. 20370

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San Diego, CA 92152

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Asst. Chief of Naval Personnel for
Human Resource Management
Washington, D.C. 20370

Dr. C. Brooklyn Derr
Associate Professor, Code 55
Naval Postgraduate School
Monterrey, CA 93940

Bureau of Naval Personnel
Research & Evaluation Division
Code: Pers-65
Washington, D.C. 20370

Human Resource Development Center
Naval Station
Norfolk, VA 23511
ATTN: Lt. Cdr. Fred Freckmann

Human Resource Management Center
London
FPO, NY 09510

Capt. D.L. Banks, Jr. USN
Human Resources Development Center
Pearl Harbor, Naval Station
FPO San Francisco, CA 96610

Human Resource Management Center
Washington
Washington, D.C. 20370

Human Resource Management School
Naval Air Station, Memphis (96)
Millington, TN 38054

Human Resource Management Center,
Pearl Harbor
FPO San Francisco, CA 96610

Human Resource Management Center,
San Diego
Naval Training Center
San Diego, CA 92133

Navy (cont.)

Mr. Keith Taylor
Office of Civilian Manpower
Management
(Code 21)
Navy Department
Washington, D.C. 20390

Mr. Joel Ellermeier
Navy Personnel R & D Center
Code 308
San Diego, CA 92152

Office of Naval Research
(Code 200)
Arlington, VA 22217

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AFPE-HR
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Georgia 30330

Dr. Allan P. Jones
Code 8030
Naval Health Research Center
San Diego, CA 92152

Navy Material Command
Employee Development Office
Code SA-65
Room 150 Jefferson Plaza, Bldg. 2
429 Jeff Davis Highway
Arlington, VA 20360

Edmund D. Thomas
(Code 307E7)
Navy Personnel Research and
Development Center
San Diego, CA 92152

ARI Field Unit - Leavenworth
P.O. Box 3122
Fort Leavenworth, KS 66027

Capt. Bruce G. Stone, USN
(Code H-35)
Director, Education & Training
Research & Program Development
Chief of Naval Education &
Training Staff
Naval Air Station
Pensacola, FL 32508

Technical Director (Code N-2)
Naval Training Equipment Center
Orlanda, FL 32813

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CDR Donald F. Parker, USN
Management Dept.
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Newport, RI 02840

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Dept. of Leadership & Law
U.S. Naval Academy
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- -

Other

Personnel Research and Development
Center
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Washington, D.C. 20415

Department of the Air Foce
Air Force Institute of Technology (AU)
AFIT/SLGR (Lt. Col. Umstot)
Wright-Patterson Air Force Base,
Ohio 45433

Division Director for Social Science
National Science Foundation
1800 G. Street, N.W.
Washington, D.C. 20550

Other (cont.)

Military Assit. for Human Resources
OAD (E&LS) ODDR&E
Pentagon 3D129
Washington, D.C. 20301